

W. SHAW.

PULLING-OVER MACHINE FOR BOOTS AND SHOES.

APPLICATION FILED SEPT. 19, 1898. RENEWED OCT. 29, 1909.

999,889.

Patented Aug. 8, 1911.

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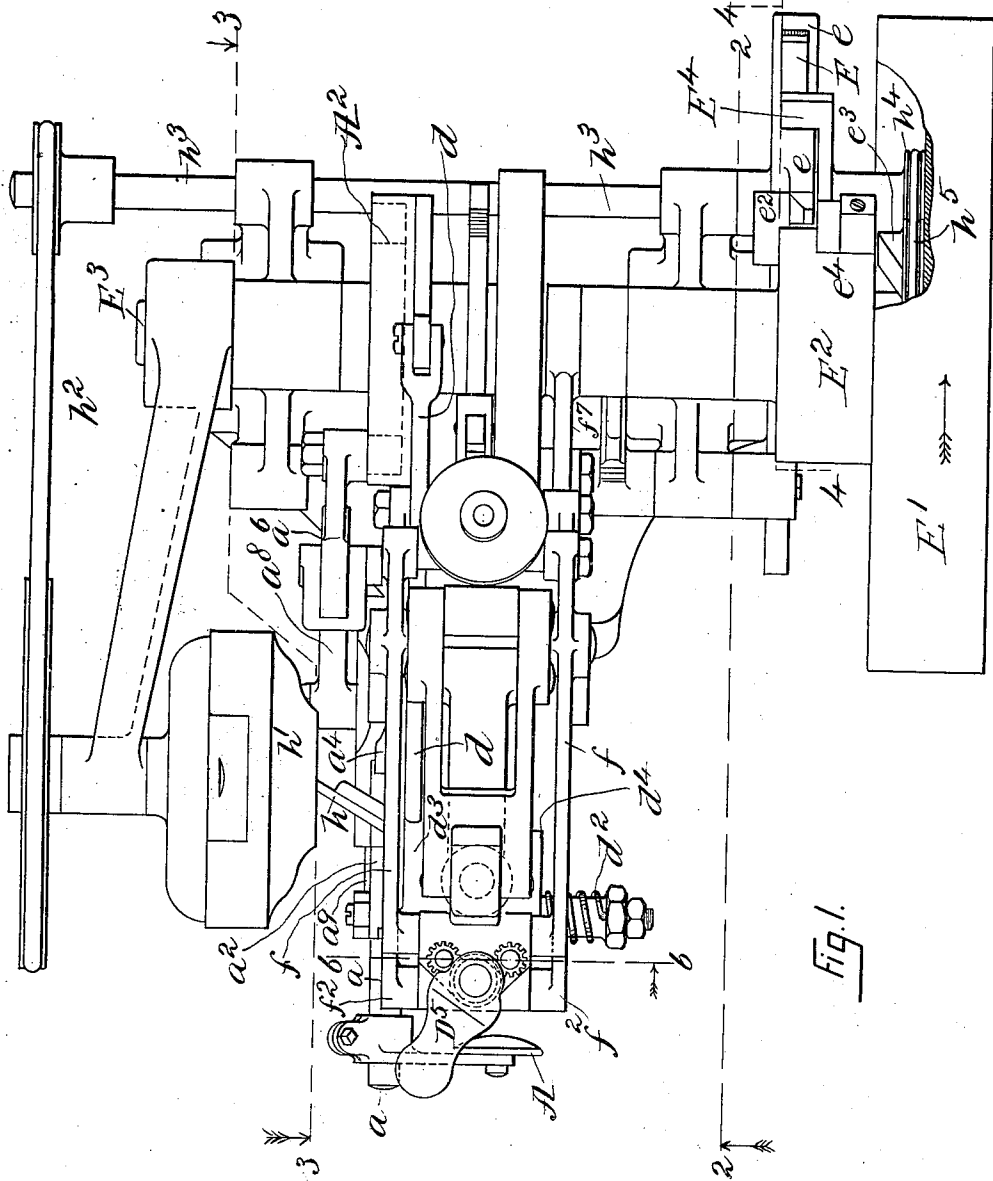


FIG. 1.

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Inventor:
Walter Shaw

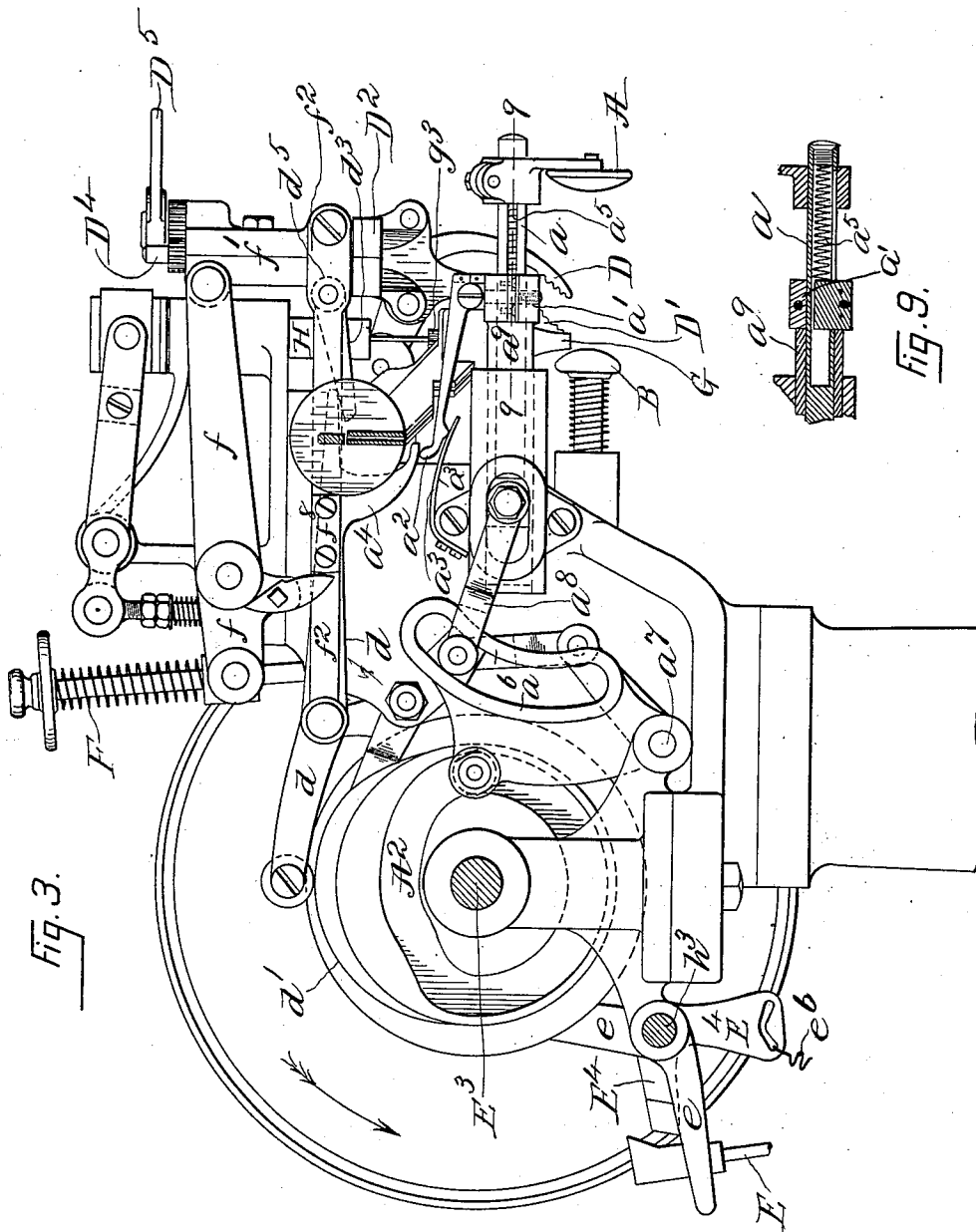
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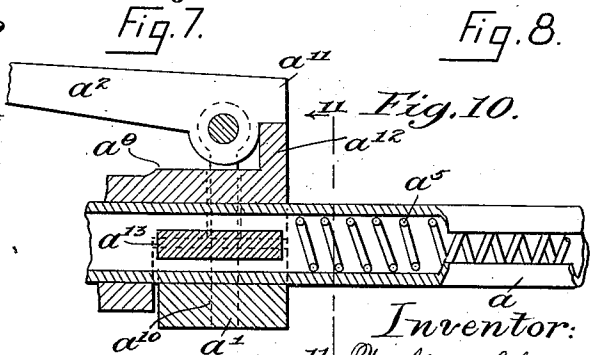
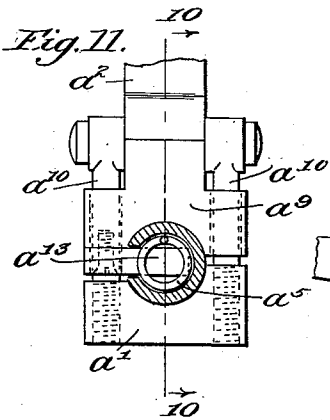
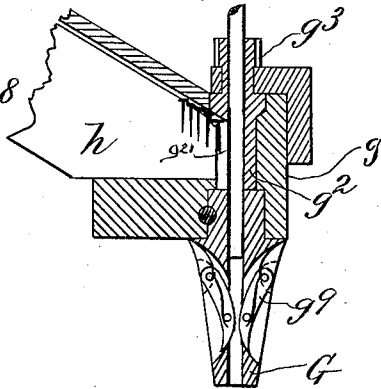
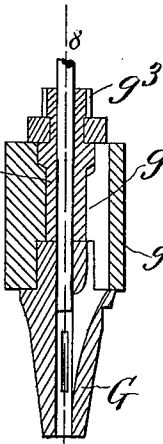
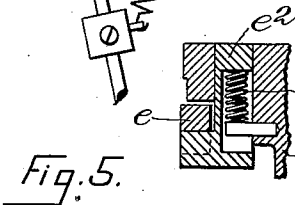
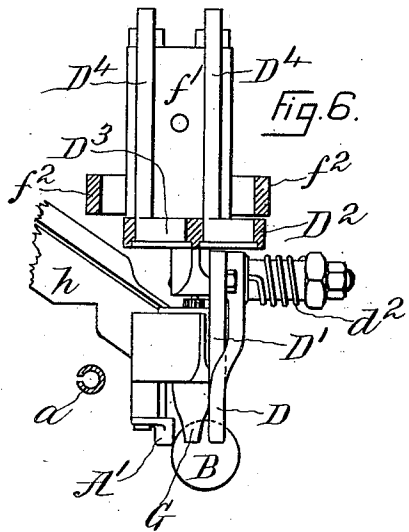
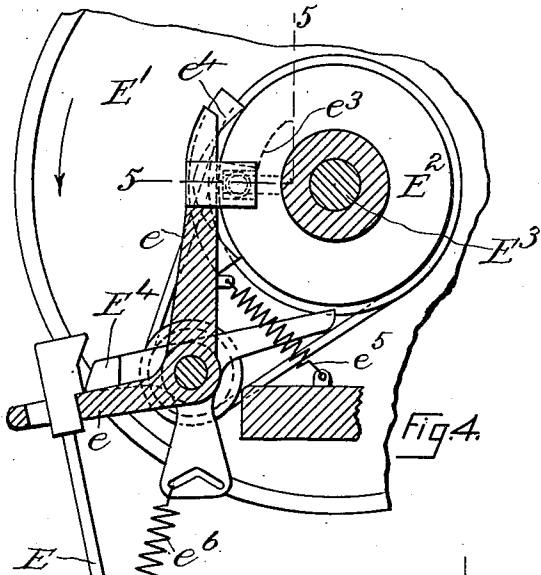
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UNITED STATES PATENT OFFICE.

WALTER SHAW, OF BOSTON, MASSACHUSETTS.

PULLING-OVER MACHINE FOR BOOTS AND SHOES.

999,889.

Specification of Letters Patent.

Patented Aug. 8, 1911.

Application filed September 19, 1898, Serial No. 691,281. Renewed October 29, 1909. Serial No. 525,373.

To all whom it may concern:

Be it known that I, WALTER SHAW, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improved Pulling-Over Machine for Boots and Shoes, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a plan of one of my machines; Fig. 2 is a sectional elevation on line 2—2 of Fig. 1; Fig. 3 is a sectional elevation on line 3—3 of Fig. 1; Fig. 4 is a section on line 4—4 of Fig. 1; Fig. 5 is a section on line 5—5 of Fig. 4; Fig. 6 is a section on line 6—6 of Fig. 1; Figs. 7 and 8 are longitudinal sections of the throat and adjacent parts, each 90° from the other; Fig. 9 is a section on line 9—9 of Fig. 3. Fig. 10 is an elevation partly in section on line 10—10 of Fig. 11, of the clamp hereinafter referred to; Fig. 11 is a section on line 11—11 of Fig. 10.

In lasting boots and shoes the first work done after the last is in place in the upper, is to pull the edges of the upper over the last at the toe, the heel and at one or two places on the sides, and to tack it at the places where it is pulled over, the usual practice being to use one tack at the heel, one at the toe, and two or three at each side. After the "pulling over" is done the work is ready for the lasting machine or for hand lasting, "pulling over" being a preparatory process.

One feature of my invention is the novel mechanism for holding the last and upper which consists of an outer gage and inner gage adapted to hold a last within a shoe upper between them, and mechanism acting substantially to cause the outer and inner gages, as soon as the last in the upper has been placed between them to hold the last and upper in place during a portion of the revolution of the machine.

Although a back gage, somewhat like my back gage B, has long been known, I am the first to use a like gage on the front or outer side of a last or boot or shoe on a last; and while my front gage is especially useful in a machine with pincers, it is obviously well adapted for use in other machines in which the upper or sole of a boot or shoe is to be operated upon while on the last.

Another feature of my invention is the combination of a work holder having an outer gage and the pincers with mechanism

to move the pincers with relation to the outer gage, so as to pull the upper over the last while the other side of the upper is held by the outer gage and additional mechanism to move the outer gage and the pincers as one in order to present the last and upper to the tacker or other fastening machine; that is the first movement of the pincers is a movement with relation to the outer gage while the second movement of the pincers is not with relation to the outer gage; but both outer gage and pincers are moved with relation to the fastening machine.

Another feature of my invention is the combination of pincers, including, of course, means to cause them to take hold of and release the upper, with two mechanisms one for moving the pincers across the sole in a direction to give a pull on the upper nearly parallel with the surface of the sole, and the other, connected with and operated by the movement of the first, for moving the pincers in a direction away from the surface of the sole while the first mechanism is operating to move the pincers to pull the upper across the sole.

A fourth feature of my invention is the combination with a fastening machine and pincers, of means to shift the pincers with relation to the nozzle of the fastening machine, for it is desirable when pulling the upper over at the sides of the last that the pincers shall be at one side of the nozzle of the fastening machine, and when pulling the upper over at the toe that the pincers shall be in front of the nozzle. This shifting of the pincers is wholly new with me, and is of much practical importance in many styles of shoes.

The starting and stopping mechanism of the machine is controlled by a treadle connected to treadle rod E and rod E is moved in one direction by the treadle and in the opposite direction by spring e^6 and is connected at its upper end to one arm of lever e whose fulcrum is shaft h^3 . (Figs. 2 and 3.) The other arm of lever e^2 engages block e^2 mounted in disk E^2 fast on shaft E^3 , see Figs. 4 and 5, and while in engagement with that block prevents shaft E^3 from rotating and also holds block e^2 out of the path of lug e^3 projecting from driving pulley E' . Block e^2 is mounted in a socket in disk E^2 and is acted on by a spring e' also mounted in that socket so that when lever e is operated to free block e^2 block e^2 is projected by its

spring e' into the path of lug e^3 which then engages block e^2 and turns disk E^2 and also shaft E^3 to which that disk is fast. Lever e is connected to one end of a spring e^5 the other end of which is connected to the frame of the machine and when lever e is released spring e^5 operates that lever so that its vertical arm is moved back into the path of block e^2 and as block e^2 approaches that arm of lever e it is acted on by an incline on the end of lever e and moved back into its retracted position in disk E^2 against spring e' and out of engagement with lug e^3 thereby disconnecting shaft E^3 and driving pulley E' , so that when block e^2 has moved far enough to engage the shoulder on lever e further movement of shaft E^3 is prevented.

Fast to disk E^2 is a cam projection e^4 and as disk E^2 revolves projection e^4 actuates a throw off lever E^4 pivoted on shaft h^3 which engages the upper end of treadle rod E and disconnects it from lever e , which is then moved into its operative position by spring e^5 . Spring e^6 is connected at one end to treadle rod E and at its other end to a slotted arm depending from lever E^4 and when it is desired that shaft E^3 shall continue to revolve as long as treadle rod E is depressed spring e^6 is connected on the right of the slot in throw off lever E^4 , instead of on the left as shown in Fig. 4, and this change moves the throw off lever E^4 into an inoperative position. When the lever E^4 is thus shifted into its inoperative position that arm of said lever which engages the rod E is carried into position above and rests on the top of the head on the upper end of the rod E , and that arm of said lever E^4 which is engaged by the projection e^4 is moved out of the path of said projection. Of course when lever E^4 is swung into this inoperative position it is necessary for the operator to reengage the head of rod E with lever e after the lever E^4 has been shifted.

The tacker may be of any usual construction, and in the form shown the driver and driver bar H and its actuating mechanism, the railway h and the hopper h' will be well understood without detailed description. The hopper of the tacker is revolved by a belt h^2 which is actuated by a pulley fast on shaft h^3 and shaft h^3 is driven by a belt connecting pulley h^4 on shaft h^3 with a pulley h^5 on the hub of driving pulley E' .

The nozzle G is secured to the block g which is fast to bracket g' ; and above the nozzle is the separator g^2 , see Figs. 7 and 8, which is actuated by pinion g^3 , and pinion g^3 is in mesh with gear g^4 driven by rack g^5 . When the driver H is not raised by its cam and connections, or in the position shown in Fig. 2, bell crank g^6 , one arm of which engages rack g^5 , holds rack g^5 against its spring g^7 , and the separator is then in position to receive the lowermost tack in the railway

h , that is the tack slot in the separator coincides with the railway and the lowermost tack is held by its head in the slot in separator g^2 . Bell crank g^6 is engaged and operated by the connecting rod of the driver bar mechanism as will be clear from Fig. 2 and when driver bar H is raised bell crank g^6 is operated by the connecting rod of the driver bar mechanism, and moves rack g^5 , gear g^4 and pinion g^3 and thus revolves separator g^2 , so as to carry the tack-receiving aperture g^{21} from the railway h around to tack chamber g^8 before plunger H is lifted above the aperture g^{21} . The tack falls, point first, and lodges between retainers g^9 until driver H is moved down to drive the tack.

The outer gage A is fast on the end of rod a which is mounted in a sleeve a^9 supported by the frame of the machine, and sleeve a^9 has mounted on it a clamp a' which is operated by a lever a^2 and caused to engage or disengage rod a to lock that rod to sleeve a^9 or to free it from that sleeve. The operator places the last and upper between the two gages A and B , gage A being then held by a spring a^3 within rod a , so far from gage B as to allow the operator to adjust the edge of the upper on one side of the last between the open jaws of pincers D, D' and the outer gage A is then pressed against the upper near the opposite side of the last as shown in Fig. 2 and locked in that position to sleeve a^9 by lever a^2 and clamp a' . As means for automatically operating lever a^2 and clamp a' when the machine is started I have shown a lever d which is acted upon by a cam d' fast to shaft E^3 and lever d is provided with a toe a^4 which engages lever a^2 and when the machine is started the toe a^4 of lever d is raised and a spring a^3 fast to the frame of the machine raises lever a^2 and operates clamp a' and locks rod a to sleeve a^9 .

As shown in Figs. 10 and 11, the clamp a' is fixed to the lower ends of two stems a^{10} , and these stems at their upper ends are pivotally connected to the lever a^2 . Lever a^2 is made with a tail piece a^{11} so that when the longer arm of said lever is swung upwardly this tail-piece engages a lug a^{12} on sleeve a^9 , thereby pulling up on the stems a^{10} and causing the clamp a' to grip rod a . The end of the sleeve a^9 has fixed to it a tongue a^{13} which projects into the rod a and serves as an abutment for the spring a^3 .

The forward end of lever d is arranged above an arm d^3 fast on rock shaft d^5 journaled at its ends in links f^2 which are connected at their forward ends to carriage f' in which the pincers D, D' are mounted; and on rock shaft d^5 is also fast an arm d^4 the free end of which is arranged above and engages a roll mounted on the upper end of the pivoted jaw D of the pincers. Jaw D of the pincers is pivoted on a stud

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projecting from carriage f' and has fastened to it one end of a spring d^2 the other end of which is fastened to that stud with provision for adjustment as shown in Figs. 1 and 5 6; and spring d^2 serves to hold jaw D in engagement with arm d^4 and through rock shaft d^5 holds arm d^3 in engagement with the forward end of lever d and lever d against cam d' .

10 The links f^2 are connected at their rear ends by a pin which is also the fulcrum of lever d and that pin also connects links f^2 with one end of slotted lever f^3 which is vibrated by bell crank lever f^4 loose on rock shaft a^7 journaled in the frame of the machine. Lever f^4 carries a cam roll which is engaged by a cam F' on shaft E^3 . The fulcrum of lever f^3 is a stud on block f^5 and block f^5 is mounted in one arm of a lever f^7 which is pivoted on shaft E^3 . The other arm of lever f^7 is a segmental gear which meshes with a segmental gear f^6 fast to rock shaft a^7 . Handle D^{10} is one end of a lever pivoted at a^7 , the other end of the lever being 25 segment f^6 , so that by moving handle D^{10} and therefore segment f^6 lever f^7 can be swung on shaft E^3 and fulcrum block f^5 adjusted in the slot of lever f^3 to vary the extent of movement of carriage f' .

30 When the pincers D D' are moved in one direction by lever f^3 the gages A and B and the last with the upper on it are held stationary and the pincers pull one side of the upper over the last while the other side of the upper is held by gage A which at that time is stationary but after the upper has been pulled over the last by the movement of the pincers in one direction and while the pincers are being moved in the opposite direction the gages and the last with the upper on it move in the same direction with the pincers, to present the last with the upper on it to the tacker. To provide for this movement of the gages sleeve a^9 is movable 45 on the frame of the machine and is connected by link a^8 to a block mounted in slotted lever a^6 and lever a^6 is pivotally mounted on shaft a^7 and carries a cam roll which is engaged by a cam A^2 fast on shaft 50 E^3 which cam is properly timed with relation to cam F' . When the extent of movement of pincers D D' is varied it is also desirable that the extent of movement of the holder be varied accordingly so that the pincers and holder may move together toward the tacker, and for this reason that end of link a^8 which is connected with slotted lever a^6 is also connected by a link to an arm fast to shaft a^7 so that when 60 shaft a^7 is turned to adjust fulcrum block f^5 link a^8 will also be adjusted.

The pincers D D' are connected directly to a bracket D^2 and that bracket is supported by two eccentrics D^3 whose shafts D^4 65 connect bracket D^2 with carriage f' , as

plainly shown in Fig. 6. Each shaft D^4 carries at its upper end a pinion which meshes with the handled gear D^5 , Fig. 1, so that by moving that handled gear the pincers are shifted on carriage f' . The carriage f' , as shown in Figs. 3 and 6, is made in two parts bolted together, between which the shafts D are confined in vertical grooves or recesses provided in the meeting faces of the two parts of the carriage. In Fig. 6, 75 which is a view from the front of the machine, the face or outer plate of the carriage is shown as removed. In pulling over at the toe it usually is necessary to have the pincers in front of nozzle G, and this is, in some cases, true also in pulling over at the heel; but in pulling over at the sides it is desirable to have the pincers at one side of the nozzle G. When pulling over at the toe and heel the front gage A is just above the surface of the sole, and does not act as a clamp. The down hold A' aids the operator, but may be turned to one side into an inoperative position when desired.

In order to move carriage f' vertically 90 while it is being moved horizontally (by links f^2 , levers f^3 and f^4 and cam F') I provide levers f which are mounted upon the frame of the machine and connected at their forward ends to carriage f' . These levers f 95 are operated by movement of links f^2 and act when so operated to move carriage f' vertically while carriage f' is being moved horizontally by links f^2 . Levers f are pivoted at f^9 and have arms f^{10} which, as shown 100 in Fig. 2, bear against the stops f^8 , under the influence of spring F. Slotted lever f^3 operates links f^2 and thereby carries stops f^8 out of contact with arms f^{10} so that spring F can act to raise carriage f' . 105

The operation is as follows: When the machine is stopped the outer gage A is unlocked and thrown out by its spring a^5 and all the other parts are in the position shown in Fig. 3. The operator places the last and upper against the inner gage B, with the edge of the upper between the jaws of the pincers D D', and presses the outer gage against the opposite part of the work, as shown in Fig. 2. As soon as the machine 110 starts the pincers DD' are closed and the rod a which carries the outer gage A is locked, by the motion of lever d , caused by cam d' fast to shaft E^3 and pincer spring d^2 ; that is cam d' allows the cam roll end of lever d to move toward the axis of shaft E^3 and thereby allows spring d^2 , to close pincers D D', by allowing arms d^3 and d^4 of rock shaft d^5 to move under stress of spring d^2 , and thereby allowing jaw D, to move on its axis so 125 that its nipping end nips the upper between it and the nipping end of jaw D'. This motion of lever d also moves toe a^4 and allows spring a^3 to actuate lever a^2 and thus cause clamp a' to lock the rod a of 130

gauge A to clamp sleeve a^9 . The pincers D D' having thus nipped the upper are moved away from the surface of the sole by the stress of spring F, which acts through levers f on the carriage f' , which is pinned to the levers f , and also pinned to the links f^2 ; and these links f^2 are moved endwise by the slotted lever f^3 , which is vibrated by cam F' through bell crank f^4 . In order to vary the throw of pincers D D' the fulcrum block f^5 of slotted lever f^3 is adjusted by moving segment f^6 , which meshes with a segment fast to lever f^7 which carries fulcrum block f^5 . It will now be clear that as the slotted lever f^3 is rocked by cam F' (fast on driving shaft E³) the links f^2 will be moved endwise to carry the pincers D D' over the surface of the sole; but this motion of the links f^2 carries stop f^8 away from one arm of levers f , and the spring F then exerts its force through levers f to move the pincers D D' away from the surface of the sole; and the resultant of these two motions is the motion desired for the pincers D D'. During this movement of the pincers D D' the outer gauge A takes much of the strain while pulling over at the sides and materially lessens the labor of the operator and enhances the quality of the work. The downhold A' and inner gauge B also assist in holding the work especially when pulling over at the toe and heel. It will be clear that I may adjust the mechanism tending to give a positive movement over the surface of the sole with relation to the movement caused by the spring so that I may have, if desired, a considerable positive pulling movement before the yielding spring movement begins. I may also readily adjust the tension of spring F so that the desired movement of the pincers away from the surface of the sole may be had. When the pincers D D' have thus pulled the upper over the last (taking about half a revolution of cam F' and shaft E³) the pincers D D' and both gages A and B move back to bring the last and upper into proper relation to the nozzle G of the tacker; the gauge A being moved back, (forcing the gauge B back against its spring), by means of cam A², slotted link a^6 , fulcrumed on shaft a^7 , link a^8 , and clamp sleeve a^9 , in which rod a is then clamped as above described. The pincers D D' are moved back by about a quarter of a revolution of cam F', and this takes place while gauge A is being moved back. As soon as the work is thus brought into proper relation with nozzle G a tack is driven; and the further revolution of cam F' carries stops f^8 against levers f and thereby swings levers f against the force of spring F, and cam d' actuates lever d to open the pincers D D' by moving jaw D against the force of spring d^2 . At the end of the last quarter revolution of shaft E³ the block e^2 is withdrawn from engagement

with lug e^3 and brought into engagement with the shoulder on lever e , as above described. Rod a of gauge A is unlocked by the latter part of the revolution of cam A², and thrown out by its spring a^5 .

What I claim as my invention is:

1. A machine for operating on an upper on the last comprising an adjustable front gage for the upper; means for automatically locking the gage when adjusted; pincers; means for automatically opening and closing the pincers; and means for moving the pincers toward and away from the front gage. 70
2. In a machine for operating on an upper on the last a work holder, comprising a back gage to engage the upper near the edge of the last; a front gage to engage the upper near the edge of the last opposite to the part engaged by the back gage; and automatic locking mechanism to prevent movement of the front gage away from the back gage during a portion of the operation of the machine, all combined substantially as described. 75 80 85 90
3. In a machine for operating on an upper on the last the combination of a work holder having an outer gage; pincers for engaging the upper; mechanism for moving the pincers relatively to the work-holder and then moving the pincers and the work-holder as one; all organized to cause the pincers to first pull the upper over the last while the opposite side of the upper is clamped between the last and the outer gage and next to move the work-holder and pincers together and thereby bring the last and upper into place to receive the fastening. 95 100
4. In a machine for operating on an upper on the last, in combination pincers; means to open and close them; mechanism for moving the pincers over the surface of the sole; a spring controlled mechanism for moving the pincers away from the surface of the sole; and connections between the two pincer moving mechanisms by means of which the action of the first controls the action of the second. 105 110
5. In combination pincers; mechanism for opening and closing them; mechanism including a cam and cam lever for moving the pincers to pull the upper over the insole; and means under control of the operator to vary the fulcrum of the cam lever while the machine is running. 115 120
6. In combination an adjustable gage; mechanism for automatically locking and unlocking it after adjustment; and mechanism for moving it while locked. 125
7. In a machine for operating on an upper on the last the combination of a mechanism for inserting fastenings having a nozzle; pincers; their carriage; adjusting mechanism to shift the pincers with relation to the nozzle of the fastening inserting mech- 130

anism, which shifting mechanism allows the pincers when in one position to operate at the front of the nozzle and when in another position to operate at the side of the nozzle; and means for operating the pincers, all substantially as described.

8. A machine for operating on an upper on the last comprising an adjustable front gage for the last; means for automatically locking the front gage when adjusted; a rear gage for the last; means for inserting fastenings; pincers; means for automatically opening and closing the pincers and moving them when closed toward the front gage, and thereby pulling the upper over the last, and also moving the pincers and the gages with the last in relation to the means for inserting fastenings, all organized to operate substantially as described.

9. In a machine of the character described the combination of a fastening driving mechanism; pincers to grip the upper; an adjustable work gage located on the opposite side of the last from the pincers; and means to automatically operate the gage to hold the work against the pulling effect of the pincers.

10. In a machine of the character described the combination of pincers to seize and pull the upper; an adjustable gage located on that side of the work opposite the pincers; and means to automatically operate the pincers independently of the gage.

11. In a machine of the character described the combination of pincers to seize and pull the upper; an adjustable gage located on that side of the work opposite the pincers; and means to automatically lock the gage.

12. In a machine of the character de-

scribed the combination of power operated pincers; an adjustable work gage located on the opposite side of the last with relation to the pincers; and means to automatically operate the work gage to enable the pincers to pull the upper tightly about the last; and means to release the pincers.

13. In a machine of the character described the combination of pincers to strain and pull upper leather about a shoe last; a fastening driving mechanism; a work gage located on the opposite side of the last; and means to operate the pincers and the gage while holding the upper strained about the last to move the work bodily toward the fastening driving mechanism.

14. In a machine of the character described the combination of a fastening driving mechanism; pincers; an oppositely positioned work gage to operate on an upper on the last; and means to cause the last to be carried under the fastening driving mechanism for the purpose of tacking the upper after it is stretched about the last.

15. In a machine of the character described the combination of pincers; means to operate them; an adjustable gage; and means to automatically lock the gage in adjusted position.

16. In a machine of the character described the combination of pincers; means to operate them; a gage; yielding means to adjust the gage in proper position; and automatic means to lock the gage in said position.

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Witnesses:

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